

# Infiltration/Inflow (I/I) Reduction Projects

King County, Washington



E & P Subcommittee Meeting  
September 3, 2008

# **Purpose & Feedback**

## **Meeting Purpose**

- Inform the E & P Subcommittee of Current Status of I/I Predesign Efforts
  - Review Predesign Process and Benefit/Cost Analysis Results
  - Review Refinements to Skyway Project Area
  - Summarize Identified Cost-Effective Projects
- Provide Recommendations for Final Design Implementation
- Respond to Questions

## **E & P Subcommittee Needed Feedback and Actions**

- E&P Consensus on Final Project Selection
- E&P Recommendations Provided to MWPAAC

# Project Timeline

## *Regional Infiltration/Inflow Program Milestones*

**2007–2008**

Predesign feasibility analysis and sewer system evaluation surveys (SSES), select 2-3 initial I/I reduction projects.

**2009**

Final Design of initial I/I reduction projects. Obtain right-of-entry agreements from property owners.

**2010–2012**

Construction of initial I/I reduction projects.

**2013**

Review of project results to determine future I/I reduction projects. King County Executive reviews and submits recommendations to County Council.

Implement regional program



# Purpose of Initial I/I Projects

- To Demonstrate & Test the Cost-Effectiveness of I/I Removal on Large Scale
- To Test Planning Assumptions for Use in Future I/I Reduction Planning
- To Learn More from Working on Private Property
- To Provide Models for Successful Future Projects
- To Test Standards, Policies & Procedures



# Recap of July E&P Meeting

- Development of Rehabilitation Unit Costs
  - Considered Difficulty of Rehabilitation in Each of the Project Areas
  - Unit Costs Significantly Higher Than Estimated During Control Program Development
- Allocation of I/I
  - Uniformly Distributed Across Basins
  - I/I Allocation Per Property Provides Useful Benchmark for Determining Cost-Effective Alternatives
- Development of Rehabilitation Alternatives
  - Over 50 Alternatives Evaluated
  - Cost-Effective Rehabilitation Most Feasible in Basins BEL031, ISS003, BLS002 & BLS003

# Recap of July E&P Meeting

- Skyway Project Area
  - Rehabilitation Did Not Appear Cost-Effective Despite High I/I Allocation
  - Relative to Other Project Areas, High I/I Removal Quantity Required to Eliminate Bryn Mawr Tube Storage



# Skyway Refinements

- Modeling Revisions Made to Correct Under-Estimation of Storage Requirement
  - Storage Required: 270,000 Gallons
  - I/I Reduction to Eliminate Storage: 2.32 MGD (Degraded); 1.81 MGD (Non-Degraded)
  - Total Project Cost for Storage: \$5.37 Million





# Cost Effective Projects

- Three Projects Meet the Cost-Effectiveness Criteria Established for the Control Program
  - Combined Bellevue and Issaquah Project
  - Skyway Alternative 1
  - Skyway Alternative 2
- Combined Bellevue and Issaquah Project
  - Includes Rehabilitation in BEL031 and ISS003
  - Rehabilitation of 107 Properties in Eastgate and 113 Properties in Issaquah for a Total of 220 Properties
  - Estimated Construction Cost of \$3.41 M; Estimated Project Cost of \$5.23 M
  - Estimated Removal of 0.85 to 1.04 MGD Peak I/I
  - Reduces Eastgate Storage by 260K - 320k Gal; Reduces Issaquah Tube Storage 370k - 450k Gal
  - CSI Project Cost Savings of \$5.60 M to \$6.97 M
  - Resulting Cost/Benefit Ratio of 1.07 - 1.33





# Cost Effective Projects

- Skyway Alternative 1
  - Alternative Developed to Provide a Cost/Benefit Ratio of 1.00 for 60% Removal Efficiency
  - Includes Rehabilitation in BLS002
  - Rehabilitation of a Total of 343 Properties
  - Estimated Construction Cost of \$3.68 M; Estimated Project Cost of \$5.63 M
  - Requires Cost Sharing of \$260k by Skyway
  - Estimated Removal of 1.81 to 2.24 MGD Peak I/I
  - Eliminates Need for Storage
  - CSI Project Cost Savings of \$5.37 M



# Cost Effective Projects

- Skyway Alternative 2
  - Alternative Developed to Provide a Cost/Benefit Ratio of 1.00 for 60% Removal Efficiency
  - Includes Rehabilitation in BLS002 and BLS003
  - Potential for Increased I/I Removal in BLS003
  - Rehabilitation of 270 Properties in BLS002 and 65 Properties in BLS003 for a Total of 335 Properties
  - Estimated Construction Cost of \$3.57 M; Estimated Project Cost of \$5.47 M
  - Requires Cost Sharing of \$100k by Skyway
  - Estimated Removal of 1.81 to 2.22 MGD Peak I/I
  - Eliminates Need for Storage
  - CSI Project Cost Savings of \$5.37 M



# Assessment of Risk

- Risk Factors Considered by King County
  - I/I is not uniformly distributed across basins as assumed; and reduction targets are not achieved
  - I/I removal targets in basins are achieved; however, a lesser reduction rate at the location of the downstream CSI project is realized
  - Peak I/I rates over-estimated in a basin selected for implementation
  - Construction costs higher than anticipated due to rehabilitation difficulty
  - Construction cost escalation is higher than anticipated
  - Drainage issues arise on multiple private properties resulting from I/I removal that require resolution as part of the project; increasing project costs
- County Believes Major Risk Factors Have Been Addressed During Predesign and Identified Projects Fall Within Guidelines Established for Control Program

# Recommendations

- Proceed to Final Design with the Combined Bellevue and Issaquah Project and Skyway Alternative 2

# **E&P Subcommittee Input and Next Steps**

- Do the Host Agencies have comments or questions
- Does the E&P Subcommittee have comments or questions regarding the presented alternatives
- Does the E&P Subcommittee endorse the recommendations to proceed forward with final design of the two projects
- Next Steps
  - Endorsement of E&P Recommendations at September MWPAAC meeting
  - Complete Predesign Report by end of year
  - Begin final design beginning early 2009